

ATGGACAATGTGGACTTCGCGGAAAGCGTGCGTACCCGTTGGGCCCGTCGCCTGATTCGT
GAAAAGGTTGCTAAGGAACTGAACATCCTGACCGAACGCCTGGGTGAAGTCCGGGTATT
CCGCCGCCGCGCGAAGGTCGTTTCCTGGGTGGCGGCTACTCACACGACAACCTGCCGAGC
GATCCGCTGTATTCCAGCATTAAACCGGCACCTGCTGAAAGAAGCCCGCGTGCCGAAGAA
GAACTGCCGCCGCGCAAAGTCTGTATCGTTGGTGC GGTTGTGAGCGGTCTGTATATTGCC
ATGATTCTGGATGATCTGAAAATCCCGAATCTGACCTACGACATCTTCGAATCGAGCTCA
CGTACCGGCGGTTCGTCTGTATACGCACCATTTTACCGATGCGAAGCACGATTATTACGAT
ATCGGTGCAATGCGTTACCCGGACATCCCGTCAATGAAACGTACCTTCAACCTGTTTAAAG
CGCACCGGTATGCCGCTGATTAAATATTACCTGGACGGTGAAAATACCCCGCAACTGTAT
AACAAATCACTTCTTTGCGAAAGGCGTGGTGGATCCGTACATGGTGTCCGGTTGCGAATGGC
GGTACCGTGCCGGATGATGTGGTTGATTTCAGTCCGTGAAAAGCTGCAGCAAGCATTGGT
TATTACAAAGAAAACCTGGCTGAAGATTTTCGACAAGGGCTTTGATGAACTGATGCTGGTT
GATGACATGACGACCCGCGAATATCTGAAACGCGGTGGCCCGAAAGGTGAAGCGCCGAAA
TACGATTTCTTCGCGATTCAGTGGATGGAAACCCAAAACACGGGTACCAACCTGTTGAC
CAAGCATTCTCGAATCAGTGATTGATAGCTTCGATTTTGTACAATCCGACCAAGCCGGAA
TGGTACTGCATCGAAGGCGGTACCAGCCTGCTGGTGCAGCGCAATGAAAGAAACGCTGGTC
CATAAAGTGCAGAACAAATAAGCGCGTTCGAAGCCATTAGCATCGATCTGGACGCACCGGAT
GATGGTAACATGTCAGTGAAAATTTGGCGGTAAAGACTACAGCGGTACAGCACCCTGTTT
AACACCACCGCTCTGGGTTGCCTGGACCGTATGGATCTGCGTGGCCTGAATCTGCACCCG
ACCCAAGCAGATGCGATTGCTGTCTGCACTACGATAATTCGACGAAAGTTGCGCTGAAA
TTTAGCTACCCGTGGTGGATCAAAGATTGCGGCATTACCTGTGGCGGTGCGGCATCGACC
GATCTGCCGCTGCGTACCTGTGTGTACCCGAGCTACAACCTGGGCGATACGGGTGAAGCA
GTGCTGCTGGCCAGTTACACCTGGTCCCAAGATGCAACGCGCATTGGTTCCCTGGTCAAG
GATGCGCCGCCGCGAGCCGCCGAAAGAAGACGAACTGGTCGAACTGATCCTGCAGAACCTG
GCACGCCTGCACGCAAGACACATGACCTATGAAAAGATCAAGGAAGCGTACACCGGTGTG
TATCACGCATATTGTTGGGCAAAATGACCCGAACTCGGCGGTGCTTTTGCCCTGTTGGT
CCGGGCCAATTCAGCAATCTGTACCCGTATCTGATGCGCCCGGCAGCAGGTGGCAAGTTT
CATATCGTGGGTGAAGCGTTCGAGCGTGCATCACGCATGGATCATTGGTTTCGCTGGAATCA
GCATATACCGCAGTGTATCAGTTTCTGTACAAATATAAAGATGTGGGATTACCTGCTCTG
CTGCTGGAACGTTGGCAGTATGGCCTGCAGGAAGTGAACCGGTAAACACGGCACCGCA
CACCTGCAATTTATCCTGGGCTCGCTGCCGAAAGAATACCAAGTGAAGATTTGA

Fig. S1. The nucleotide sequence of the codon-optimized gene of *LysOX*, *lysox3*. The substituted nucleotides are shown in red.